

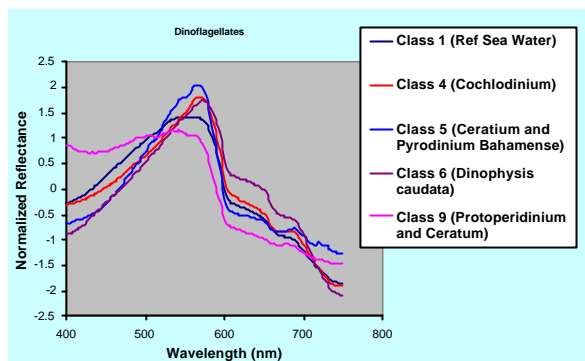
Development of a Regional Environmental Monitoring System using Remote Sensing Satellite Data for Environmental Well-Being of the Seas and Oceans in East and Southeast Asia

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CRISP's 6-m X band antenna for MODIS data reception



Spectral signatures of several types of dinoflagellates. The signatures enable them to be differentiated from sea water.

Goal and Contribution to Well-Being of the Environment:

The main purpose of the proposed project is to develop a satellite-based regional monitoring and information delivery system to provide timely information about the environmental situation of the seas and oceans in the East and Southeast Asian region. Emphasis will be placed on detection and monitoring of phytoplankton blooms in the regional waters. Timely information derived from remote sensing helps in providing early warning of phytoplankton bloom occurrences.

Rationales

The East and Southeast Asian region is undergoing rapid development. The developmental process brings with it great impacts on the environment. The oceanic environment is particularly sensitive to the influence of human activities. For examples, oil spills, red tides, coastal erosion and sedimentation are common environmental problems encountered in the East and Southeast Asian waters.

In-situ monitoring of the coastal and oceanic environment has been carried out in many areas. However, they are limited by their spatial and temporal coverage. Remote sensing from satellites is a good complementary method for monitoring the environmental situation of the regional seas and oceans, with a wide spatial coverage and periodic acquisition of data. Information that can be derived from ocean color includes chlorophyll concentration, water turbidity and suspended sediments. Occurrence of phytoplankton blooms can be detected by observing the change in reflectance spectra of the surface water.

Implementations

The project will:

1. Develop an automated system to retrieve water quality parameters of interest (such as chlorophyll, sediment and turbidity) from satellite data (MODIS, GLI etc) of the region;
2. Acquire matching satellite and sea-truth data for fine-tuning the existing algorithms for the regional waters;
3. Develop and implement algorithms for detection of phytoplankton blooms from ocean color data;
4. Develop a web-based system for timely delivery of the derived regional environmental information to interested users, and to deliver educational information to the general public to create awareness about the environmental situation of the regional seas and oceans.

Invitation for Collaboration

Collaborators are welcome to contribute sea-water sampling data or to collaborate in conducting sea-truth trips in the regional seas. The data would be useful for developing, fine-tuning and testing of algorithms to retrieve environmental parameters from satellite data.